

Abstract of the Disclosure

**COMPOSITE OF SILICA REACTED WITH BLOCKED
MERCAPTOALKOXYASILANE AND ALKYL SILANE, RUBBER
COMPOSITION WITH SAID COMPOSITE, AND ARTICLE
HAVING COMPONENT THEREOF**

5
10
15
20
25
30

The invention relates to amorphous silica (e.g. silica aggregates) having hydroxyl groups (e.g. silanol groups) on its surface which has been pre-reacted (e.g. pre-hydrophobated) with a combination of blocked mercaptoalkoxysilane coupling agent and an alkyl silane to form a composite. The invention further relates to a rubber composition which contains such composite, particularly as reinforcement. The invention additionally relates to article of manufacture, such as for example a tire, having at least one component of such rubber composition. The blocked mercaptoalkoxysilane is composed of a mercaptosilane where the hydrogen moiety of the mercaptan moiety is substituted with a blocking moiety which allows the alkoxy groups of the mercaptoalkoxyasilane to react with a precipitated silica having hydroxyl groups (e.g. silanol groups) on its surface for the silica pre-treatment thereof yet renders the mercapto portion of the mercaptoalkoxysilane as being relative inert insofar as subsequent coupling reaction with the elastomers until the blocked mercapto portion of the mercaptoalkoxysilane becomes unblocked. Further, generation and release of reaction byproducts (e.g. alcohols) caused by reaction of alkoxy groups of the mercaptoalkoxysilane and byproducts from reaction of alkoxy or halogen groups of the alkylsilane with the hydroxyl groups of the amorphous silica is basically relegated to the pretreatment (said pre-reaction) of the blocked mercaptoalkoxysilane and alkylsilane with the silica and thereby essentially dissociated from and consequently eliminated, or at least minimized, during the actual subsequent mixing with the elastomer(s). Upon subsequent unblocking of the blocked mercapto moiety of the mercaptoalkoxysilane of the pre-hydrophobated silica within the rubber composition during the subsequent vulcanization of the rubber composition at an elevated temperature, the silica becomes coupled via the mercapto group of the mercaptoalkoxysilane to one or more elastomers of the rubber composition.